UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Jul 20, 2020

MEMORANDUM

SUBJECT: Site Inspection Report
Tanglefoot Lane Site
Bettendorf, Iowa

FROM: Venessa Madden, Ecological Risk Assessor
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TO: Andrew Gieseke, On-Scene Coordinator
Assessment Emergency Response and Removal Branch
Superfund and Emergency Management Division

As requested, we have reviewed the April 2020 draft Site Inspection (SI) Report for the Tanglefoot Lane site in Bettendorf, Iowa. We focused our review on data gaps in investigation activities pertaining to the site conceptual model and ecological and human health risk assessment. If you have questions or need additional assistance, please contact Venessa at x7794, Ann at x7930, Jessica at x7064, or Breanna at x7769.

Ecological Risk Assessor Comments

1. Some of the metals, the majority of the pesticides, bis(2-ethyl)phthalate, and Aroclor-1254 exceed ecological screening levels for soil (U.S. Environmental Protection Agency [EPA], 2018). Most of the maximum concentrations used to screen the Contaminants of Potential Concern (COPCs) were found in the landfill area or the oil pit. However, to further refine COPCs identified from sample locations outside of areas where a removal action may occur, we recommend collecting no less than 5 background samples. This will help differentiate potential site-related contamination from naturally-occurring background.

2. A number of metals, pesticides, and polycyclic aromatic hydrocarbons (PAHs) exceed ecological screening levels for sediment (EPA, 2018). We recommend collecting no less than 4 to 5 background sediment samples to further refine the list of sediment COPCs (in addition to the one upstream sample included in the 2018 sampling). A number of the maximum detections for PAHs were located at the downstream sediment sampling location directly adjacent to Middle Road. If samples collected from the tributary within the site, as well as upstream of the site, show lower concentrations, then the likely source of the downstream PAHs is run-off from the road.

3. The water quality criteria for a number of the dissolved metals are hardness dependent. Hardness data are necessary to interpret the results of the sampling. We recommend collecting site-specific hardness measurements.

4. Copper and manganese in surface water exceed ecological screening levels (EPA, 2018). Further, some of the detection limits were above ecological screening levels. We recommend collecting no less than 4 to 5 background surface water samples to further refine the list of surface water COPCs (in addition to the one upstream sample included in the 2018 sampling).

5. No surface water or sediment samples have been collected within the stretch of stream that occurs on the site. We recommend that any future sediment or surface water include at least 2 or 3 samples from within the site boundary.

Human Health Risk Assessor Comment

6. We recommend collecting more soil samples located near the landfill and oil pit radiating out from the center to help better delineate the lateral and vertical extent of the source area for potential excavation and disposal. For human health risk assessment purposes, surface soil, and soil up to 4 feet in depth (shallow excavations by utility workers) would be helpful to assess potential site risks for likely receptors. More specifically, surface soil is defined as the top 2 centimeters (EPA, 1996); however, if deeper soils might be disturbed and brought to the surface, then it is appropriate to collect samples up to 2 feet below ground surface.

Hydrogeologist Comments

7. **Section 1.0 (p. 1) and Section 2.1 (p. 2).** Sections 1.0 and 2.1 indicate that unpermitted landfilling of municipal and industrial wastes occurred from the 1950s to the 1970s. The following comments are noted.

    a. Because the period of industrial waste acceptance overlaps the manufacture and use of per- and poly-fluorinated alkyl substances (PFAS), and because numerous private drinking water wells are located within a mile of the site, analyzing private drinking water well samples for PFAS is recommended. If additional site groundwater samples are collected, PFAS analysis should be considered at these locations as well.

    b. The approximate elevation at the base of each disposal area should be characterized to the extent possible based on historical records and aerial photographs. This information will support verification or determination of appropriate sample collection depths.

8. **Section 2.1 (p. 2), Tables 3 and 4, and Appendix E.** The second paragraph of Section 2.1 notes "steep topographical slopes." However, in Tables 3 and 4 and Appendix E, the vertical location of each direct-push technology (DPT) soil gas and groundwater sample is presented as a depth below ground surface (bgs) rather than an elevation, making it difficult to compare relative vertical distributions of water and contamination in the subsurface (*e.g.*, to characterize vertical extent of contamination or distinguish perched groundwater from an aquifer unit). If detailed topographic surface data are available or can be obtained for the site, depth measurements should be converted to elevations (a lower degree of accuracy may limit comparison). Additionally, elevation data should be collected to support future investigations.

9. **Section 2.2 (p. 3).** The discussion of site geology does not include depth to (elevation of) groundwater, depth to (elevation of) bedrock, or the nature of the underlying bedrock. This information is critical for the site conceptual model and should be included. Until site-specific information is obtained, regional studies may be referenced.

10. **Section 2.2 (p. 3) and Section 2.3 (p. 4).** The second full paragraph on page 3 states: "Direction of groundwater flow is to the south." A similar statement is made on page 4. The basis for this statement is unclear and does not appear to be well supported by the draft Site Inspection Report or the 2016 Preliminary Assessment Report referenced. Both reports rely on site topography and the statement: "Depth of groundwater at the southern end of the site is consistent with creek levels." However, no water levels are indicated with greater distance from the stream (*e.g.*, on the north side of the site, or beyond the site in any direction), no fixed monitoring wells are associated with the site or adjacent properties, and no other lines of evidence are indicated to support groundwater flow assertions on a site or regional level. In the absence of site monitoring wells, available lines of evidence should be applied to assess site groundwater presence (*e.g.*, boring log moisture content) and flow in the context of regional hydrogeologic conditions (*e.g.*, Iowa Geological Survey [IGS] Water Atlas http://publications.iowa.gov/26579/1/WA-06.pdf, IGS GeoSam https://www.iihr.uiowa.edu/igs/geosam/home). Preference is for higher-resolution site characterization to establish groundwater migration pathways and ultimately, fixed, surveyed monitoring locations to establish the direction of groundwater flow.

11. **Section 2.3 (p. 4).** Section 2.3 states: "A sanitary sewer pipe routed to the west of the landfill area and then south toward the municipal collector system was installed under Tanglefoot Road in 2013." Because subsurface utility conduits may serve as conduits for contaminant migration, including non-aqueous phase liquids and vapors, utility conduits proximate to the site should be mapped and their depths/elevations relative to site sources and the water table noted.

12. **Section 2.6.2 (pp. 7-8).** Section 2.6.2 discusses the Preliminary Assessment (PA) sampling results. Although Figure 3 shows the PA sampling locations, Section 2.6.2 makes no reference to these sampling locations and the PA sampling results are not presented on the figure. No table is provided as a crosswalk between the PA sampling results and locations, and the PA sampling data are not compared to risk-based values (other than Superfund Chemical Data Matrix [SCDM] benchmarks) as is done in the SI Report. Recommendation is to better integrate the EPA data collected under both the PA and SI to facilitate more holistic site understanding and decision making.

13. **Section 3.1 (p. 10, Table 3) and Section 3.6 (p. 18, Table 9).** The first paragraph of Section 3.1 states: "One soil-gas sample was collected upgradient of the site (north) at DPT-1 to represent background conditions." Similarly, Section 3.6 states: "One sub-slab vapor sample was collected from a residence northeast of the site to represent background conditions." A single exterior or sub-

slab soil-gas sample collected hundreds of feet from the site is unlikely to represent background conditions and would not be considered sufficient evidence to dismiss contaminants in soil gas or indoor air at the site. Future sampling events should consider using other, more rigorous lines of evidence (*e.g.*, ambient air, chemical inventory and removal) in determining whether indoor air concentrations are associated with vapor intrusion (see EPA, 2015).

14. **Section 3.2 (p. 11).** The second sentence of Section 3.2 states: "Because of limited groundwater production, the list of analytes was reduced for samples collected at ...DPT-3 and -5 (VOCs and SVOCs were the only analytes)..." The following comments are noted.

    a. Based on a review of the analytical data in Appendix G (see pages 226-230 of the PDF file), the reference to DPT-5 (7219-204) should be DPT-6 (7219-205).

    b. Inability to collect sufficient groundwater for some or all analyses at some proposed DPT sampling locations should be identified as a data gap. Preference is for higher-resolution site characterization to establish groundwater migration pathways and verify whether and where groundwater contamination is migrating offsite.

15. **Section 3.2 (p. 12).** The partial sentence at the top of page 12 states: "No groundwater was encountered at the upgradient location (DPT-1) placed to represent background conditions." Because offsite concentrations of naturally-occurring metals in groundwater exceed EPA maximum contaminant levels or treatment technique levels, recommendation is to establish background threshold values for these compounds. Ideally, groundwater samples will be collected from well-developed monitoring wells so that suspended solids do not influence analytical results.

16. **Section 3.5 (p. 16).** Section 3.5 describes indoor air sampling activities. No building survey or chemical inventory appears to have been conducted in conjunction with these activities, and no field records indicating these activities are appended. Future indoor air sampling activities should be supported by building surveys and chemical inventories. To the extent possible, EPA recommends that "potential indoor sources be removed from the structure and stored in a secure location at least 24 to 72 hours prior to the start of sampling," based on typical air exchange rates in residential buildings (EPA, 2015).

17. **Table 8 (p. 17).** An asterisk to Table 8 is defined as "Vapor mitigation system installed." Revise to clarify the type of vapor mitigation system, whether the system is active or passive, who installed the system (e.g., resident, agency), the reason for system installation, and how long the system had been operating prior to sample collection.

18. **Section 3.6 (p. 18) and Table 9.** Section 3.6 indicates that a sub-slab vapor sample was collected to represent background conditions, but neither the residence address nor the sample identifier is provided for this sample. Section 3.6 should be revised to include this information.

19. **Section 3.7 (p. 19).** Section 3.7 indicates that groundwater samples were collected from six private drinking water wells within a mile of the site. Because Appendix A identifies 24 private drinking water wells within a mile of the site, clarification should be provided as to how these six wells were selected and whether wells of higher priority were identified but could not be accessed for sampling.

20. **Table 10 (p. 20).** Table 10 should be revised to include well identification numbers, so that the addresses and sample identifiers listed can be readily cross walked with the private well information provided in Appendix B.

21. **Section 4.0, Data Summary Tables.** The data summary tables only include analytes that are detected, which may be confusing to a reader who does not recall the analytical methods run at each location. Recommendation is to revise the table titles from "Summary of [Matrix] Sample Results" to "Summary of Analytes Detected in [Matrix] Samples," and to list the analytical methods run in the footnotes. Without such clarification, for example, the absence of trichloroethylene (TCE) and tetrachloroethylene (PCE) data in the surface water tables appears to be a data gap, considering the high concentrations in site groundwater.

22. **Section 4.2 (p. 22) and Figure 6.** The first paragraph of Section 4.2 indicates that in direct-push groundwater sample 7219-201, benzene was detected at 1.3 J µg/L, above the EPA regional screening level (RSL) for tap water (0.46 µg/L), and vinyl chloride was detected at 8.0 J µg/L, above the EPA maximum contaminant level (MCL) of 2 µg/L. Because 7219-201 was collected northwest of the property boundary and these volatile organic compounds (VOCs) are potentially attributable to the site, additional investigation is recommended to determine whether the site conceptual model (*e.g.*, groundwater flow direction) requires refinement or whether an offsite source of these contaminants exists.

23. **Sections 5.0, 6.0, and 7.0 (pp. 37-42).** In general, these three sections should be revised to acknowledge or address the numerous data gaps identified in comments from all parties above. Examples include:

    a. **Section 5.1 (p. 37).** The last sentence of Section 5.1 identifies hazardous constituents associated with on-site sources. See comment 7a.

    b. **Sections 5.2, 5.2.1, and 5.2.1 (pp. 37-38).** The discussion of off-site migration of site COPCs is focused on PCE and TCE although other COPCs have been detected on and off site. Although metals and other VOCs are written off as naturally occurring, these assertions are not well supported by sampling or other lines of evidence. See comments 15 and 22. Because metal COPCs have been detected in multiple private well samples, this has implications for site scoring.

    c. **Section 5.3 (pp. 38-39).** See ecological risk assessor comments.

    d. **Section 5.4 (p. 40).** Regarding the soil pathway, see human health risk assessor comment.

    e. **Section 5.4 (p. 40).** Regarding the subsurface intrusion pathway, Section 5.4 states "there is no indication that contamination has migrated off-site." See comments 14b, 15, and 22.

    f. **Section 5.4.2 (p. 40).** Section 5.4.2 states: "The source of VOC contamination in indoor air and sub-slab vapor samples off site is unknown and is not suspected to be site-related." Considering the absence of good data regarding source/sample elevations, groundwater flow directions, and preferential pathways, this conclusion is not sufficiently supported. See comments 7b, 8, 9, and 11.

g. **Section 5.5 (p. 40).** Section 5.5 states: "Ambient air sample results indicated that concentrations of the VOCs benzene, carbon tetrachloride, chloroform, and ethyl benzene exceeded EPA SCDM benchmarks. These detections are not believed to be related to the site." The following comments are noted:

   i. The conclusion that the detections are not site related is unsupported by the discussion of the ambient air sample results in Section 4.5, or comparison of the COPCs detected in ambient air to COPCs detected in other onsite media. Data and discussion are needed to support this conclusion.

   ii. Section 3.5 (p. 16) states: "six ambient air samples were collected at three locations upwind of and within areas where indoor air samples were collected (three per sampling event) to assess airborne levels of contaminants of concern that could impact concentrations of analytes in indoor air samples." The report is unclear whether the ambient air sampling locations were selected for purposes of determining contributions by the site to air, determining contributions of background sources to air, or both. These critical distinctions also are needed to evaluate the air data at each location and their implications with regard to the air and subsurface intrusion pathways.

h. **Section 6.0 (p. 41).** Section 6.0 twice states that contaminants at levels of concern appear to be "contained onsite." See comments 23b, e, f, and g above.

i. **Section 7.0 (p. 42).** See comments 23a through 23h above.

24. Appendix D (PDF page 96). Note that the field notes in Appendix D include the following statement: "Property owner said there was another historical dump just west of the intersection of Crow Creek and Middle Road. He was interested if it may be impacting water quality." Recommendation is that the On-Scene Coordinator document actions taken to address or refer this item and other contamination (*e.g.*, the sub-slab PCE vapors detected south of the creek) should sufficient lines of evidence find it to be non-site specific.

References

U.S. Environmental Protection Agency. 1996. Soil Screening Guidance: User's Guide. Publication 9355.4-23. Office of Solid Waste and Emergency Response, Washington, D.C.

U.S. Environmental Protection Agency. 2015. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. 9200.2-154. June.

U.S. Environmental Protection Agency. 2018. Region 4 Ecological Risk Assessment Supplemental Guidance. March 2018 Update. Scientific Support Section. Superfund Division. USEPA Region 4. Atlanta, GA.